

## Substitutions

KONA F4 Today, Dale was making up a glaze that called for Kona F4 – a Feldspar. We did not have any. I suggested he use the Soda Feldspar, of which we have maybe 50 lbs. It's what we usually use for any soda feldspar. So we had questions.

Here are some hand links:

<http://ceramicartsdaily.org/ceramic-supplies/ceramic-raw-materials/feldspars-used-in-ceramic-glazes-and-clay-making/> Provides good definitions as well as a chart comparing the elemental make up of all Feldspars.

<http://ceramicartsdaily.org/pottery-making-illustrated/feldspar-the-potter%E2%80%99s-pet-rock/> has a discussion about substituting Feldspars, but consider the Kona F4 as a soda feldspar.

Bottom line is Kona F4 is a Soda Feldspar. It might be interesting to test the glaze using the Kona VS our Soda Feldspar...see if there are any notable differences. Based on their compositions, there really shouldn't be any.

## ZIRCOPAX, SUPERPAX, ULTRAPAX, ULTROX

- Zircopax is a brand name version of zirconium silicate. It is often used for semi-opaqueness, finer materials like Superpax being used for full opacity.

In North America, the most popular zirconium opacifiers are made by TAM, and fall under the brand names of Zircopax, Superpax and Excelopax. These vary according to particle size, the finer the size the greater the scattering of light (and thus the better the opacification). In addition, the finer sized materials contain a little extra silica for maximum whiteness.

Zirconium silicates are used primarily as opacifiers in glazes at all temperatures. Although tin oxide is more effective, zirconium materials are much cheaper and are more stable in reduction and less reactive with some colorants (i.e. chrome). Although zirconium oxide is effective as an opacifier, zirconium silicates disperse better and are cheaper where the glaze can tolerate or be reformulated to tolerate the added silica.

My notes show that you can use eight parts of superpax to replace ten parts of zircopax. The superpax gives about ten to fifteen per cent more opacifier than the zircopax.

<b>Ultrox</b>	A very stable, reliable opacifier widely used in large commercial potteries. Not as potent as Tin Oxide but stronger than Superpax.
<b>Superpax</b>	Zirconium silicate opacifier 92 - 94.5%. Used in slips and glazes as an opacifier much the same as zircopax, ultrox or tin oxide. Has a relatively small particle size for better dispersion. NLA use Zircopax.
<b>Zircopax plus</b>	<i>Opacifier. 94 - 96% pure. Used much the same as Superpax now with a finer particle size. A little stronger &amp; more economical to use than regular Zircopax.</i>

Ultrox is a tradename for Zirconium Oxide, ZrO<sub>2</sub>. Zircopax and Opax are tradenames for Zirconium Silicate, ZrSiO<sub>4</sub> (ie, ZrO<sub>2</sub>.SiO<sub>2</sub> in a crystalline structure that does not melt at C10+). The oxide and the

silicate do not behave the same in a glaze slurry nor do they have equal opacifying effect/result on the fired pot, when used in the same weight percent addition. Some years ago, there was comment from a few potters that said Ultrox gave them a pain.